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Biostatistics in the United States and Japan

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Introduction

This issue of ENVIRONMENTAL HEALTH PERSPECTIVES includes the proceedings of a conference sponsored by the Japan Society for the Promotion of Science and the U.S.-Japan Cooperative Cancer Research Program. The conference brought together American biostatisticians with Japanese mathematicians and epidemiologists to exchange ideas in statistical methods and approaches applied in cancer research in the United States and Japan. Interestingly, the conference helped to provide a formal introduction, perhaps for the first time, between the mathematical statistics and the medical (cancer) research communities in Japan, with the American contingent in effect serving as the catalyst.

The field of statistics as an independent discipline has not developed in Japan as it has in the United States. In the U.S. there are over 190 universities offering graduates degrees in statistics, about 35 of which specialize in the field of biostatistics (*1*). In contrast there are no independent departments of statistics in any Japanese university, although mathematical statistics is taught under the mathematics curriculum in several of Japan's national and private universities. The primary reason for the absence of statistical units in Japan appears to lie in the vertical structural organization of Japanese universities (and other institutions as well). Interaction between different departments is minimal, reflecting a general societal pattern in which individuals tend to associate primarily with those in their own group rather than with individuals, even of similar attributes, in other groups (*2*). Since biostatistics is a discipline traditionally formed by the merger of different groups — mathematics and statistics on the one hand, biology and medicine on the other — its development would run counter to usual patterns in Japan and has been slow. The same applies, although to a somewhat lesser extent, to statistics. Mathematical statistics has attracted some interest as a result of the challenging mathematical problems offered, but applied statistics has developed few followers (a notable exception is in the area of quality control, where the impetus arose not so much from the mathematical community as from industrial interest following the pioneering demonstrations of the utility of quality control measures in Japan in the 1950s by W. Edwards Deming).

Biostatistics began its development in the United States in the early 1900s. In 1916, 15 years after publication of the first volume of the British journal BIOMETRIKA, the first biostatistics department in the U.S. was founded at the Johns Hopkins University School of Hygiene and Public Health. Although the American Statistical Association was chartered prior to the U.S. Civil War, it was not until 1938 that a Biometrics Section was formed. The first issue of the Section's Bulletin declared it to be ". . . primarily for biologists who see in statistics a potent tool for their work," and Volume I No. 1 begins with an article on "some uses of statistical methods in medicine" (*3*). Biostatistics has grown continually since that time. Stimulated in large part by the increasing emphasis on the interdisciplinary approach, most organizations in the United States involved in biomedical research now have scientists specifically trained in biostatistical methods.

The conference proceedings presented in this issue of the journal highlight the involvement of biostatistics in cancer research in the U.S. and Japan. Review papers on current statistical techniques employed in cancer epidemiology in the U.S. are presented, and a series of papers describing statistical methods now being applied to biomedical problems in Japan, most of which are based upon the

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application of the system of multivariate techniques known as Hayashi's quantification methods, are introduced. Although the proceedings represent only a small collection of articles on cancer biostatistics in the U.S. and Japan, it is hoped that the compilation may be useful for biomedical researchers in both countries.

REFERENCES

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